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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,919	07/24/2003	Xiaohui Wang	86326SLP	9493

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PATENT LEGAL STAFF
EASTMAN KODAK COMPANY
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ROCHESTER, NY 14650-2201

EXAMINER

STREGE, JOHN B

ART UNIT	PAPER NUMBER
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2624

MAIL DATE	DELIVERY MODE
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05/31/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/625,919

Applicant(s)

WANG ET AL.

Examiner

John B. Strege

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 10 and 11 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-9 and 12 is/are rejected.
- 7) ☐ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

Response to Amendment

1. The amendment received 2/20/07 has been entered in full.

Response to Arguments

2. Applicant's arguments with respect to the claims have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 5-9, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Capozzi et al. USPN 5,164,993 (hereinafter "Capozzi") in view of Doi et al. USGPUB 2002/0172403 (hereinafter "Doi").

Regarding claim 1 Capozzi discloses a method of segmenting a radiographic image into diagnostically relevant and irrelevant regions (col. 1 lines 5-10, lines 43-58, and the paragraph bridging columns 2 and 3) comprising: acquiring a digital radiographic image including a matrix of rows and columns of pixels (col. 5 lines 23-30, and col. 5 lines 57-64); detecting the initial background left point of a histogram of said image (col. 7 lines 15-27, col. 8 lines 49-65); detecting the foreground of said image using the initial background left point (col. 7 lines 28-53); regenerating the background of said image (paragraph bridging cols. 10-11); validating the background of said image

Art Unit: 2624

(col. 11 lines 22-33); merging the background and foreground regions of said image as diagnostically irrelevant regions (smoothing function, paragraph bridging cols. 11-12).

Capozzi does not explicitly disclose extracting the anatomy region of said image as the diagnostically relevant region.

It is well known in the art of image processing to extract regions of interest so that the irrelevant information can be ignored. Doi discloses such a system where regions of interest are extracted from a radiographic image (paragraph 100).

Capozzi and Doi are analogous art because they are from the same field of endeavor of processing radiographic images.

At the time of the invention it would have been obvious to one of ordinary skill in the art to extract the region of relevant information from the image of Capozzi with the motivation being that there is no reason to keep the irrelevant information so it will free up storage space. Thus it would have been obvious to one of ordinary skill in the art to combine Capozzi and Doi to obtain the invention of claim 1.

Regarding claim 2, Capozzi discloses an xray film digitizer (paragraph bridging cols. 5-6).

Regarding claim 5, Capozzi discloses wherein regenerating the background uses a region growing method from a set of known background pixels based on the initial background left point or transition pixel (col. 9 line 43-col.10 line 69).

Regarding claim 6, Capozzi discloses wherein the validating said background includes determining whether the ratio between the background region and all the non-foreground region exceeds a certain threshold and whether the dynamic range of all the

non-foreground region is greater than a minimum threshold and if one or both are not then the background detected is invalid (col. 11 lines 5-33).

Regarding claim 7, the smoothing would remove any transition gaps between the regions (paragraph bridging cols. 11-12).

Regarding claims 8-9, it is well known to carry out extraction by subtracting regions of the foreground from the background thus the Examiner declares official notice with the motivation being that this is how extraction is normally carried out.

Regarding claim 12, the regenerating of the background is accomplished by region growing (paragraph bridging cols. 10-11).

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Capozzi et al. USPN 5,164,993 (hereinafter "Capozzi") in view of Doi et al. USPGPUB 2002/0172403 (hereinafter "Doi"), and further in view of Wang et al. (US Patent No 6,212,291), hereinafter referenced as Wang.

Regarding claim 4, Jiang and Dewaele disclose everything as applied above (see claim 1). Although Jiang and Dewaele disclose extracting the foreground of the image, they fail to specifically disclose the foreground extraction method recited in claim 4. However, the examiner maintains that it was well known in the art to provide for extracting the foreground of an image by: providing as inputs an acquired digital radiographic image and an initial background left point, using a smart edge detection process to classify all significant transitions in the image, conducting a Hough Transform to delineate all the lines that are possible collimation blades, finding

candidate partition blade pairs if said image has several radiation fields, lining a divide-and-conquer process to partition said image into sub-images containing only one radiation field, and identifying the best collimation for each sub-image to detect the foreground, as taught by Wang.

In the same field of endeavor, Wang discloses providing as inputs an acquired digital radiographic image and an initial background left point, using a smart edge detection process to classify all significant transitions in the image, conducting a Hough Transform to delineate all the lines that are possible collimation blades, finding candidate partition blade pairs if said image has several radiation fields, lining a divide-and-conquer process to partition said image into sub-images containing only one radiation field, and identifying the best collimation for each sub-image to detect the foreground, as disclosed at column 4 line 39 - column 5 line 10, which reads on "providing as inputs said acquired digital radiographic image and said initial background left point; using a smart edge detection process to classify all significant transitions in said image; conducting a Hough Transform to delineate all the lines that are possible collimation blades; finding candidate partition blade pairs if said image has several radiation fields; lining a divide-and-conquer process to partition said image into sub-images containing only one radiation field; and identifying the best collimation for each sub-image to detect the foreground".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify Jiang and Dewaele, by providing for providing as inputs an acquired digital radiographic image and an initial background left point,

using a smart edge detection process to classify all significant transitions in the image, conducting a Hough Transform to delineate all the lines that are possible collimation blades, finding candidate partition blade pairs if said image has several radiation fields, lining a divide-and-conquer process to partition said image into sub-images containing only one radiation field, and identifying the best collimation for each sub-image to detect the foreground, as taught by Wang, for the purpose of improving the accuracy of the foreground detection algorithm.

Allowable Subject Matter

6. Claims 10-11 are allowed.
7. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2624

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Strege whose telephone number is (571) 272-7457. The examiner can normally be reached on Monday-Friday between the hours of 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS


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